



**BIOENERGY, CLIMATE, AND ENVIRONMENT
FOOD PRODUCTION AND SUSTAINABILITY
YOUTH, FAMILY, AND COMMUNITY
FOOD SAFETY AND NUTRITION
INTERNATIONAL PROGRAMS**



NIFA

Opportunities For Feedstock R&D Through NIFA Programs

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June 6, 2023



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Congress Authorizes and Appropriates NIFA's Programs

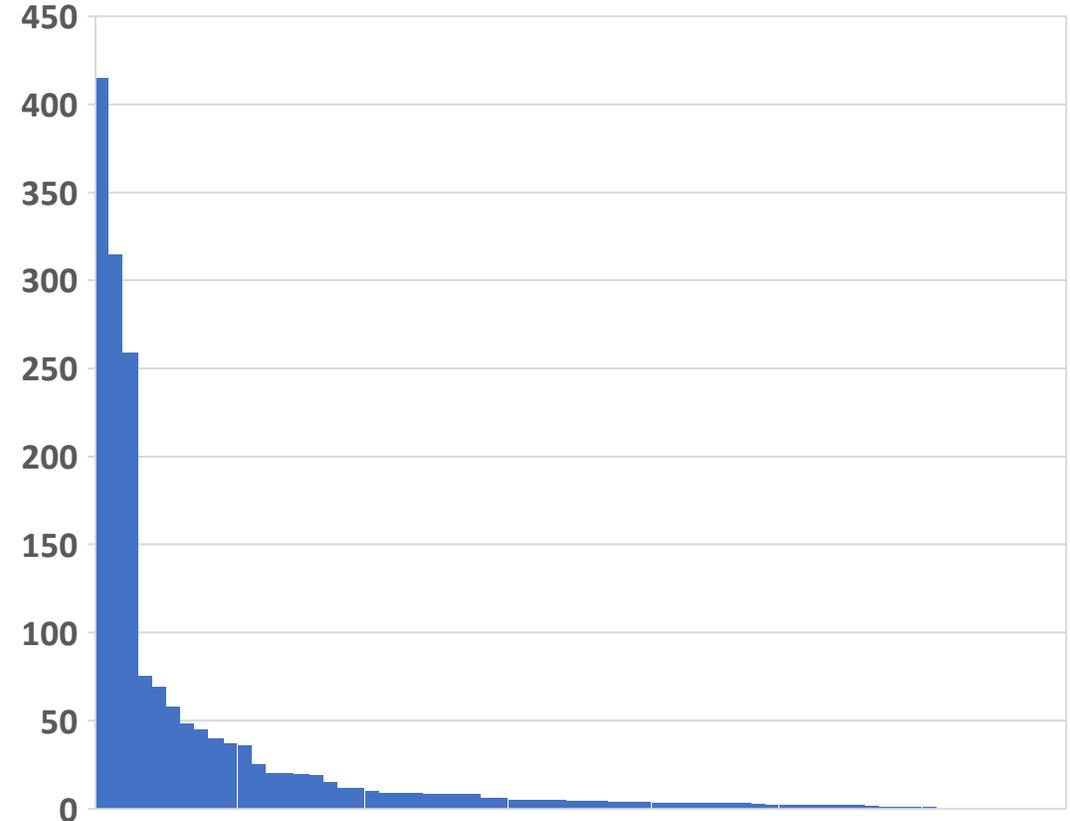
FY23 - \$2.2 B in over 80 program lines

Capacity

- Hatch
- Smith-Lever
- Evans Allen
- 1890 Extension
- EFNEP
- Etc.

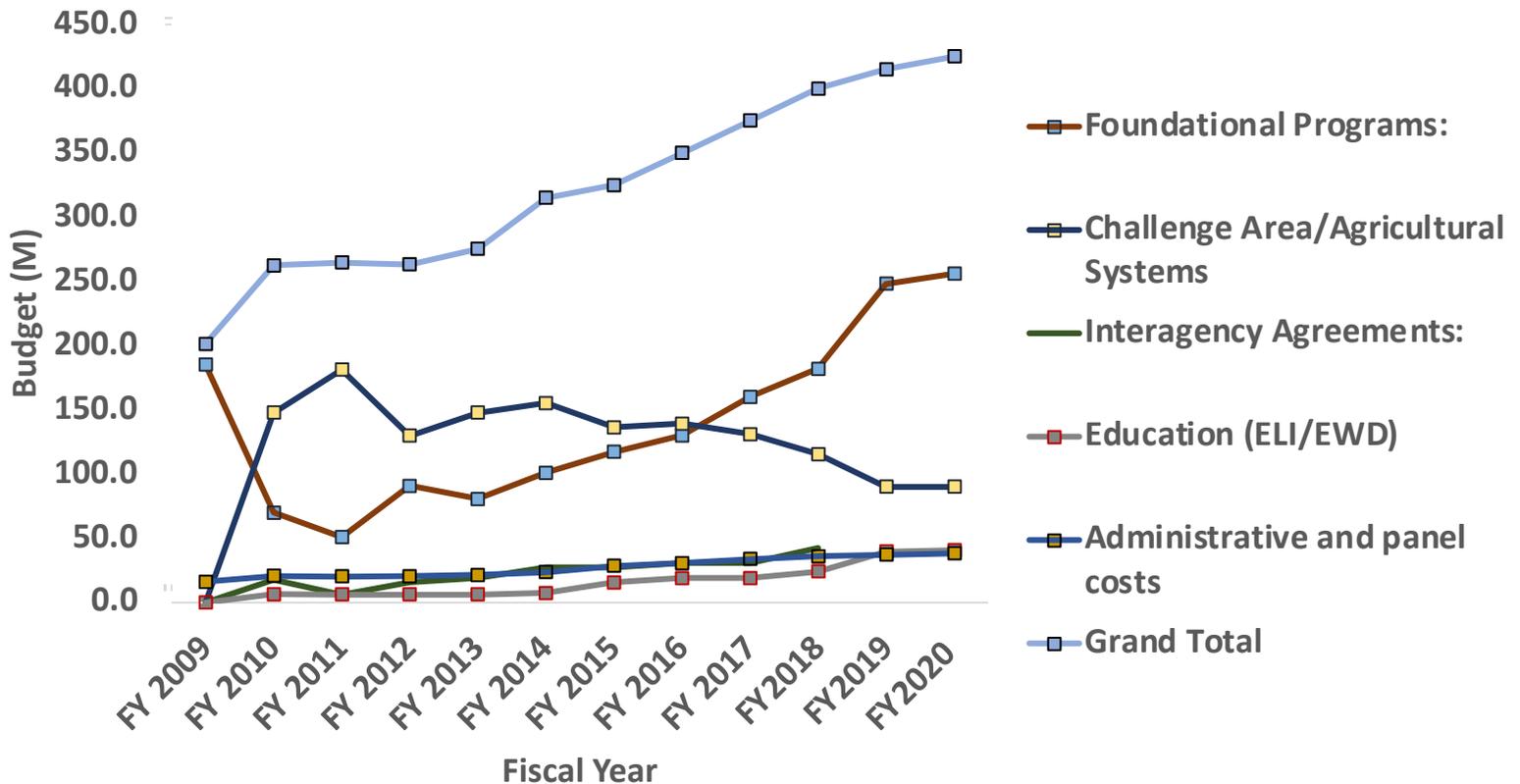
Competitive

- AFRI
- SCRI
- OREI
- SARE
- Etc.

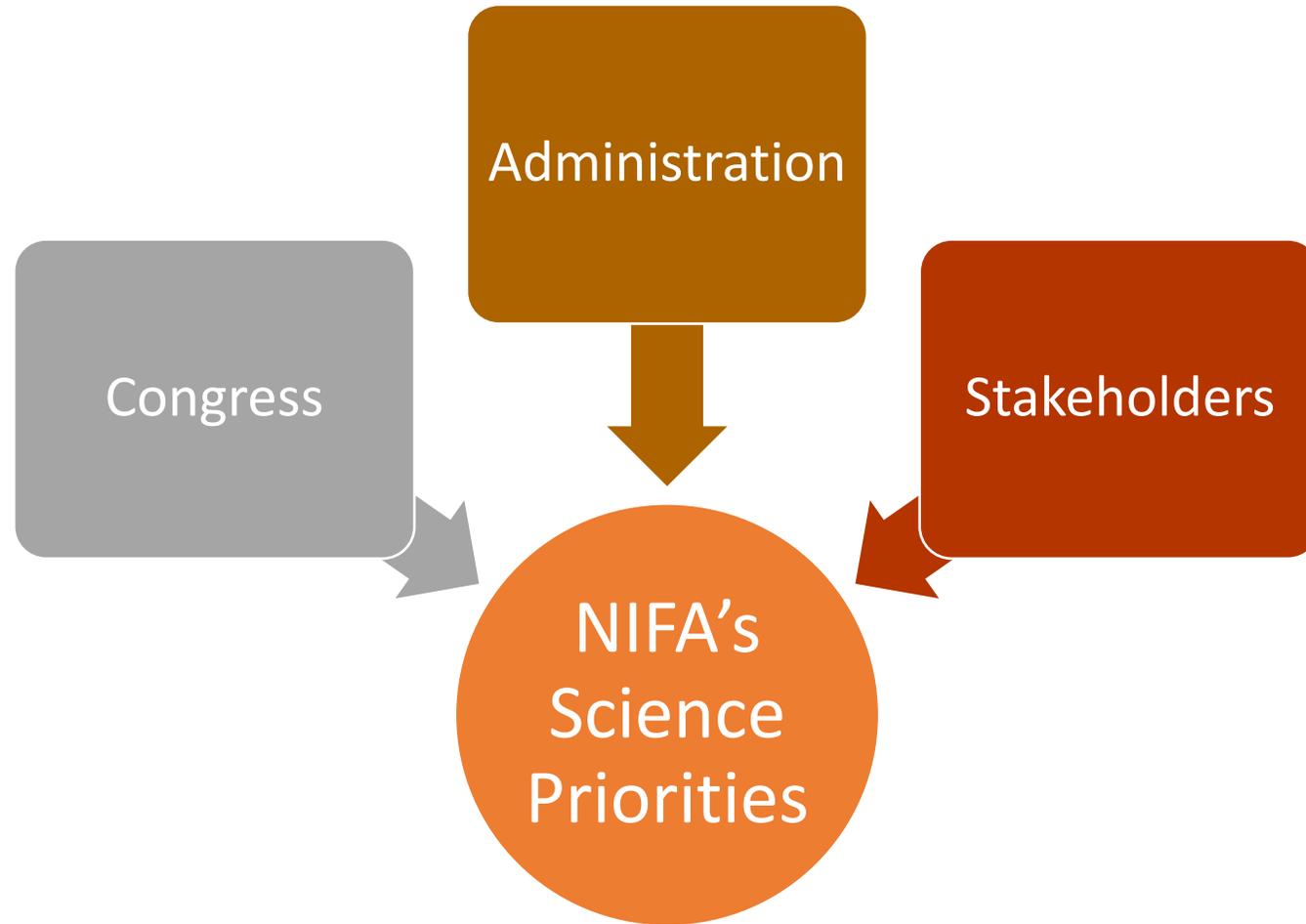


AFRI is USDA's Flagship Extramural Research Program

- AFRI-funded research, extension, and education projects are vital
- Key mechanism to support
 - National science priorities
 - Critical and Emerging Issues
 - Administration Priorities
 - Interagency Collaborations
- AFRI in Numbers
 - Budget: \$455 million in FY2023



Key Drivers for NIFA's Science



Stakeholders Shape NIFA's Science Directions

2018 NIFA FACT Workshop

High Throughput, Field-Based Phenotyping Technologies for the Genomes to Fields (G2F) Initiative

January 28-30, 2018 | The Gateway Hotel & Conference Center, Ames, Iowa

[Download Meeting Agenda](#)

With funding provided by a USDA NIFA FACT conference grant, Iowa State University is hosting this workshop that will expose the field-based G2F data generators, many of whom are novel tools and approaches for data analysis, as well as best practices for ing G2F data with the larger research community.

Workshop

RFA

Agriculture and Food Research Initiative Competitive Grants Program

Foundational and Applied Science Program

Fiscal Years (FY) 2021 and 2022 Request for Applications

LETTER OF INTENT DEADLINE: Varies by Program Area
APPLICATION DEADLINE: Varies by Program Area

ACCESSION-NO: 1022368 · [Full-Record](#) ·
PROJ-NO: IOW05612 · AGENCY: NIFA-IOW ·
PROJ-TYPE: AFRI-COMPETITIVE-GRANT · PROJ-STATUS: NEW ·
CONTRACT/GRANT/AGREEMENT-NO: 2020-68013-30934 · PROPOSAL-NO: 2019-05478 ·
START: 01-JUN-2020 · TERM: 31-MAY-2023 ·
GRANT-AMT: \$2,900,000 · GRANT-YR: 2020 ·
AWARD-TOTAL: \$2,900,000 ·
INITIAL-AWARD-YEAR: 2020 ·

INVESTIGATOR: Schnable, P. S.; Castellano, MI, J.; Dong, LI,.; Ganapathysubramanian, BA,.; Dill, CA, JO. ·

PERFORMING-INSTITUTION: ·
IOWA-STATE-UNIVERSITY ·
2229-Lincoln-Way ·
AMES, IOWA-50011 ·

HIGH-INTENSITY-PHENOTYPING-SITES: · A-MULTI-SCALE, MULTI-MODAL-SENSING-AND-SENSE-MAKING-CYBER-ECOSYSTEM-FOR-GENOMES-TO-FIELDS ·

High Intensity Phenotyping Sites

05467 ·
START: 01-SEP-2020 · TERM: 31-AUG-2023 ·
GRANT-AMT: \$3,000,000 · GRANT-YR: 2020 ·
AWARD-TOTAL: \$3,000,000 ·
INITIAL-AWARD-YEAR: 2020 ·

INVESTIGATOR: Ge, Y.; Thomasson, JO, AL.; Baenziger, P, ST.; Murray, SE,.; Ibrahim, AM,.; Schnable, JA, CA.; Sandall, LE,.; Shi, YE,.; Bai, GE,.; Belamkar, VI,.; El-Basyoni, IB, SA. ·

PERFORMING-INSTITUTION: ·
UNIVERSITY-OF-NEBRASKA ·
LINCOLN, NEBRASKA-68583 ·

HIGH-INTENSITY-PHENOTYPING-SITES: ·

NON-TECHNICAL-SUMMARY: The overall goal of this project is to establish two complementary high-intensity phenotyping sites at University of Nebraska-Lincoln (UNL) and Texas A&M University at College Station, TX (TAMU), focusing on maize and wheat. Our four specific objectives are: (1) Support two ongoing community-based plant phenotyping efforts at both UNL and TAMU; namely, the maize Genomes to Fields Initiative (G2F) and the winter wheat breeding programs; (2) Advance and apply Unmanned Aerial Vehicles (UAVs) as our main platform for sensor deployment and data

USDA Administration Priorities



- **Climate Smart Agriculture & Forestry Practices**
- **Adaptation/ Resilience**
- **Measurable Carbon Sequestration**
- **Measurable GHG Mitigation**
- **Climate Smart Commodities**
- **Linking Extension Service to Climate Actions**
- **Sustainable Aviation Fuels**



USDA Strategic Plan: FY 2022 -

2026 Strategic Goals:

- I) Combat climate change to support America's working lands, natural resources, and communities
 - 1.1 Use Climate-Smart Management and Sound Science to Enhance the Health and Productivity of Agricultural Lands
 - 1.2 Lead Efforts to Adapt to the Consequences of Climate Change in Agriculture and Forestry
 - 1.3 Restore, Protect, and Conserve Watersheds to Ensure Clean, Abundant, and Continuous Provision of Water Resources
 - 1.4 Increase Carbon Sequestration, Reduce Greenhouse Gas Emissions and Create Economic Opportunities (and Develop Low-Carbon Energy Solutions)



NIFA Funding Opportunities:

AFRI Foundational and Applied Science Program

- Executive Summary, page 4
 - *...climate change, nutrition security, markets, indigenous traditional ecological knowledge, equity for underserved producers...*
- Background, page 13
 - *...adaptation and mitigation...*
- <https://www.nifa.usda.gov/afri-request-applications>



AFRI Foundational and Applied Science Program:

- | | |
|---|--------------|
| 1. Plant Health and Production and Plant Products | \$61 million |
| 2. Animal Health and Production and Animal Products | \$56 million |
| 3. Food Safety, Nutrition, and Health | \$38 million |
| 4. Bioenergy, Natural Resources, and Environment | \$37 million |
| 5. Agriculture Systems and Technology | \$51 million |
| 6. Agriculture Economics and Rural Communities | \$30 million |



NIFA AFRI Funding Opportunities:

Plant Health and Production and Plant Products ~ \$66 million

A1102 – Foundational Knowledge of Agricultural Production Systems

A1112 – Pests and Beneficial Species in Agric Production Systems

A1152 – Physiology of Agricultural Plants

A1141 – Plant Breeding for Agricultural Production

A1113 – Pollinator Health: Research and Applications

A1143 – Conventional Plant Breeding for Cultivar Development



NIFA AFRI Funding Opportunities:

Bioenergy, Natural Resources, and Environment ~ \$37 million

A1401 – Soil Health (includes Signals in the Soil)

A1411 – Water Quantity and Quality

A1414 – Sustainable Bioeconomy through Biobased Products

A1451 – Sustainable Agroecosystems: Health, Functions, Processes and
Management

A1461 – Environmental Justice

NIFA AFRI Funding Opportunities:

Agriculture Systems and Technology ~ \$29 million

A1521 – Engineering for Agricultural Production and Processing

A1531 – Biorefining and Biomanufacturing

A1551 – Engineering for Precision Crop and Water Management

A7303 – AI Institutes (collaboration with NSF)



NIFA AFRI Funding Opportunities:

Agriculture Economics and Rural Communities ~ \$34 million

A1601 – Small and Medium-Sized Farms

A1642 – Social Implications of Food and Agricultural Technologies

A1651 – Environmental and Natural Resource Economics

NIFA AFRI Funding Opportunities:

Crosscutting Programs ~ \$42 million

A1402 – Agric. Microbiomes in Plant Systems and Natural Resources

A1701 – Critical Agricultural Research and Extension (CARE)

A1541 – Data Science for Food and Agricultural Systems (DSFAS)

A1261 – Inter-Disciplinary Engagement in Animal Systems (IDEAS)

A1181 – Agricultural Biosecurity

A1721 – Extension, Education and USDA Climate Hubs Partnerships

CAP for Climate Smart Extension

A1811 – AFRI Commodity Board Co-funding Topics

A1712 – Rapid Response to Extreme Weather Events Across Food and Agric. Systems

A1556 – Regional Innovation and Demonstration of Climate-Smart Agric. for Future Farms

AFRI Sustainable Agriculture Systems Program - \$80 million

1. Climate-Smart Agriculture and Forestry
2. Strengthening the Bioeconomy
3. Food and Nutrition Security
4. Enteric Methane Emissions



NIFA AFRI Funding Opportunities:

AFRI Education and Workforce Development - \$68 million

- A7101 Predoctoral Fellowships
- A7201 Postdoctoral Fellowships
- A7703 Special Topics: Youth Innovators Empowering Agriculture Across America (YEA)





Other NIFA Programs

- Sustainable Agriculture Research and Education (SARE)
- Beginning Farmer & Rancher Development Program (BFRDP)
- Sun Grant Program
- Crop Protection and Pest Management (CPPM)

Capacity Funds

- Hatch and Hatch multi-state
- Evans-Allen
- Agricultural Extension Programs at 1890 Institutions
- McIntire-Stennis
- Smith-Lever
- RREA

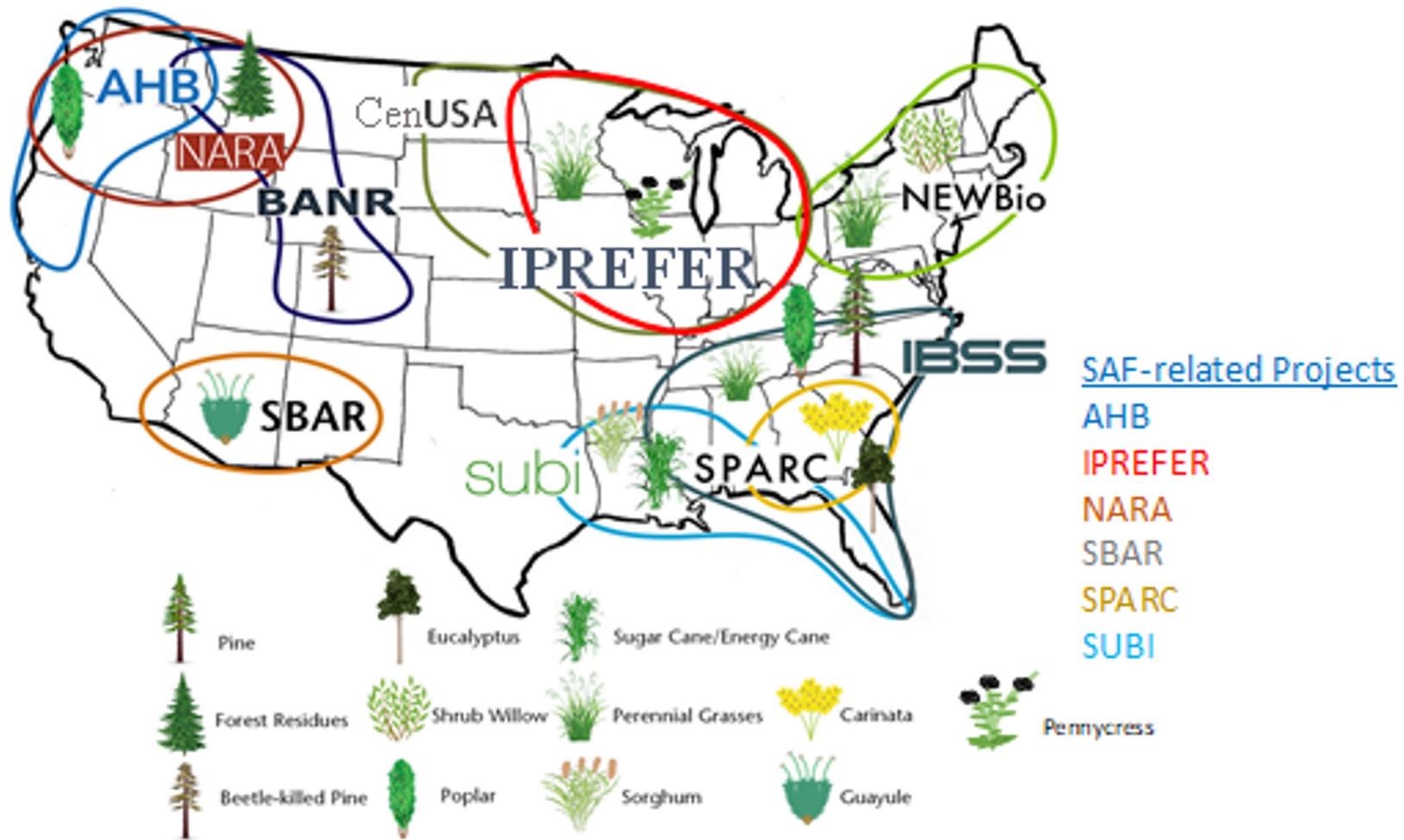


Sustainable Aviation Fuels (SAF) Grand Challenge

- Feedstock development
- Optimization of SAF production from oilseed crops
- Expanding the near-term availability of fats, oils, and greases (FOG) including oilseed crops
- Sustainable crop and forest management at scale (climate smart agriculture & forestry)
- Post-harvest supply chain logistics (transportation, storage, preprocessing)
- Regional supply chain integration, optimization, and decarbonization
- Sustainability analysis (environmental, economic, social)
- SAF co-product development
- Extension/outreach/tech transfer
- Workforce development



National Institute of Food and Agriculture - Coordinated Agriculture Projects





Sustainable Aviation Fuels (SAF) Grand Challenge

- Carbon Monolith Catalysts from Wood for Biobased Platform Chemicals
James Kastner University of Georgia \$472,965
- Sustainable Bioeconomy for Arid Regions (SBAR)
Kim Ogden University of Arizona \$3,762,500
- PARTNERSHIP: Data-driven Chemo-selective Lignin Valorization Process to Biochemicals and Aviation Fuel
Zhaohui Tong Georgia Tech \$800,000
- Southeast Partnership for Advanced Renewables from Carinata (SPARC)
Ian Small University of Florida \$3,762,500



Sustainable Aviation Fuels (SAF) Grand Challenge

- Efficient Production Of Renewable Jet Fuel And Bio- Amines From Genetically Optimized Camelina

Hongfei Lin

Washington State University

\$467,122

- Oilseed Pennycress - A new cash cover-crop for the Midwest

Winthrop Phippen

Western Illinois University

\$10,000,000

- Renewable carbon-negative distillate fuels: Conversion of willow feedstocks into liquid fuels and biochar

Tristan Brown

SUNY- ESF

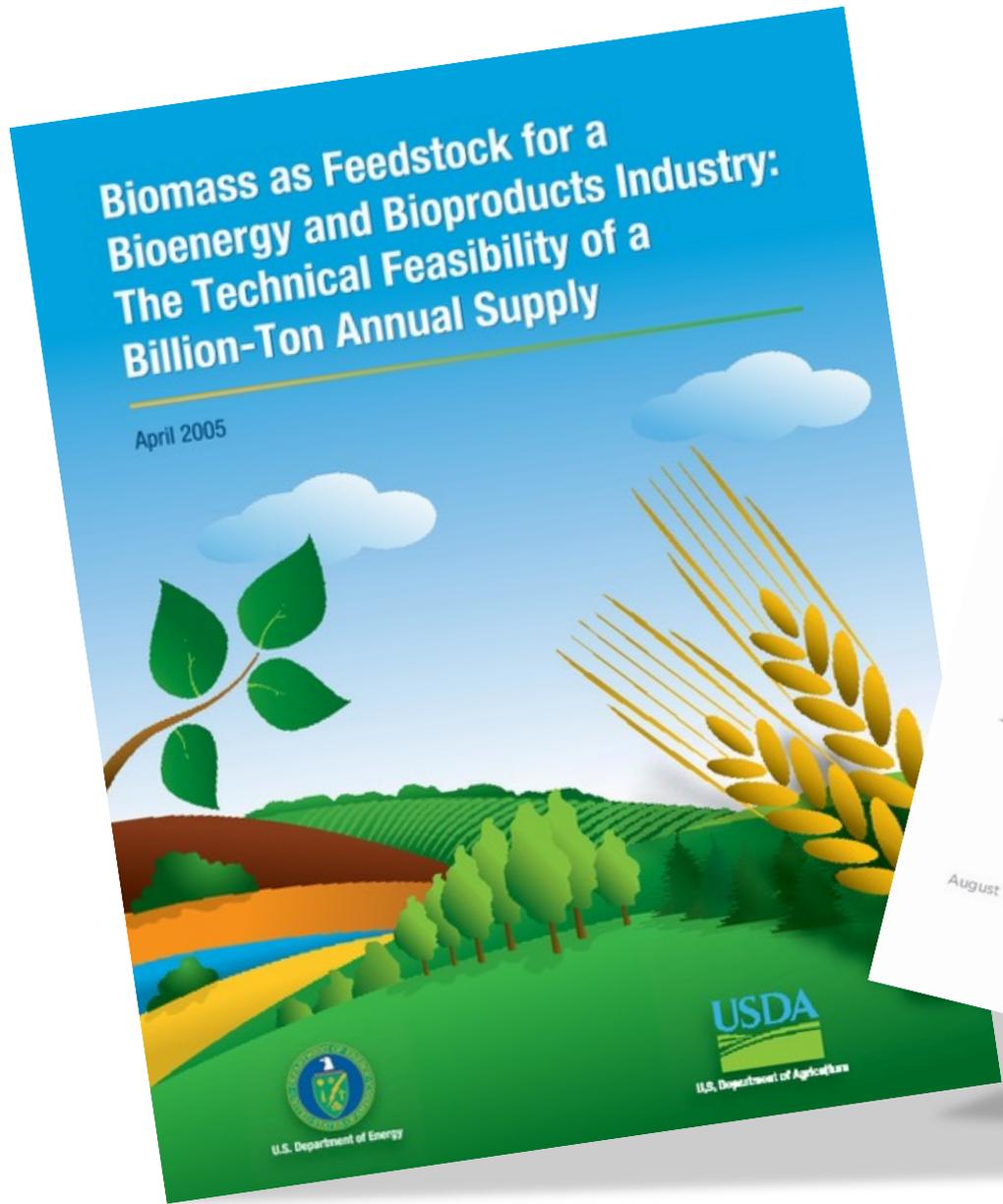
\$999,900

- Improving Oilseed Crops Via Phenylpropanoid Pathway Engineering

Wesley Winkelman

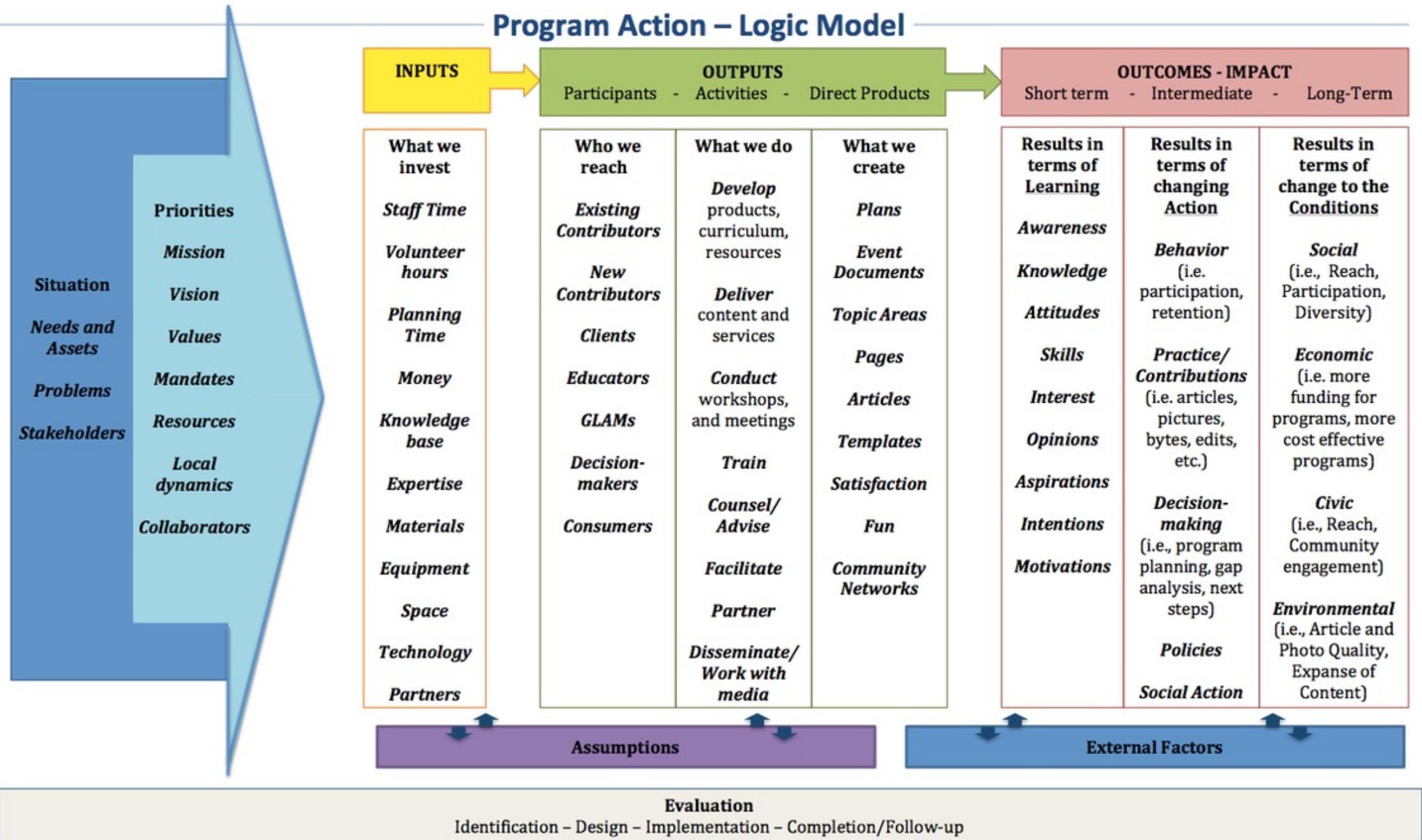
NC State University

\$442,173



<https://www.energy.gov/eere/bioenergy/2016-billion-ton-report>

Program Action – Logic Model





NIFA Climate Adaptation Plan

- **KEY CLIMATE CHANGE VULNERABILITIES**
- Water Quality and Quantity
- Agroecosystem Productivity and Sustainability
- Food and Nutrition Security
- Resilience To Extreme and Variable Weather Events
- Education Pipeline
- Continuity of Operations



We Look Forward To The Work Ahead

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